Examiner Handbook

on the use of the

U.S. Patent

Classification System

Search and Information Resources
U.S. Patent and Trademark Office

1992

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INTRODUCTION

Detailed, authoritative guidelines set forth for the creation, development, and administration of the U.S. Patent Classification System are contained in the document entitled "Development and Use of Patent Classification Systems (DUPACS)", published in January 1966. Refer to DUPACS for more comprehensive information about the general practices and procedures outlined herein.

The U.S. Patent Classification System provides for the storage and retrieval of every patent document which a patent examiner needs to review when examining patent applications. Therefore, in the aggregate, the system must be exhaustive of all patentable subject matter under patent laws. Although the system is primarily designed to assist patent examiners performing patentability searches, the system is used by a wide variety of other users, e.g., patent attorneys and agents, people involved in research and development, and the patrons of the Patent and Trademark Depository Library (PTDL) system.

The present U.S. Patent Classification System reflects the uneven growth derived from the first general scheme created in 1900. Classification prior to 1900 closely paralleled economic groupings of the period with informal and arbitrary subdivisions to provide manageable size collections. Relationships among such patent applications, if they existed, were lost in the alphabetical ordering of titles assigned to each of the collections. Search notes, class and subclass definitions, or schedule explanations either did not exist or, at most, were primitive.

While all of the present major groupings have been "revised" since 1900, each class reflects the theories of classification which existed at the time it was reclassified. The guidelines set forth below are generally applicable only for classes revised since 1940. The location of the "miscellaneous" subclass is a good indicator of the age of any class. If this subclass is placed in any location other than the last subclass in the schedule, it can be assumed that the class was reclassified prior to 1940. For further information on the original distribution date of any class, refer to the "Current Pages of Manual of Classification", beginning on page CP-1.

This handbook is intended for use by U.S. patent examiners. Also, two condensed handbook versions entitled "Handbook on Use of the USPC System" and "Handbook on Use of the USPC System for Patent and Trademark Depository Libraries" are available for other users.

This handbook is based on and draws heavily from the "Guide to the U.S. Patent Classification Systems", issued in June 1973. We are indebted to its author and authors of earlier publications on patent classification for much of the useful information which has been reproduced in this handbook.

The authors wish to thank the many members of the Documentation Organizations who have read and commented on this handbook. Their comments have been integrated into this publication. It is hoped that this handbook will provide system users with a clearer understanding of the system, its use, and its administration.

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April 9, 1992

I. ORGANIZATION OF INFORMATION

A. Bases of Classification

A variety of rationales have been developed over the years to subdivide our classification files into searchable units. Collections of art based on each of the following rationales can be found in the system as it exists today. Thus, keep in mind the strengths and weaknesses of each rationale when conducting a search.

1. Industry or Use

This approach divides art on the basis of the industry employing the art or the use to which a device is put. It provides a unique collection wherein all relevant devices for a given technology are housed in one convenient location. Several original classes were created using this rationale and a number of these classes still exist today, e.g., Bee Culture, Butchering, etc.

A drawback associated with classifying in the above manner is that physically similar art is separated without a meaningful distinction. Thus, the search process is lengthened. If the above classification process is used excessively, the chances of issuing two patents for the same idea becomes a greater probability. To illustrate, the 1872 classification system separated cooling devices on the basis of the product treated in these devices, e.g., beer or milk. These cooling devices could well be analogous and both should be considered in performing any search for cooling devices, per se.

2. Proximate Function

To avoid the tendency to fragment the art based on its industry or use, the U.S. Patent and Trademark Office uses the fundamental, direct, or necessary function as the principal basis of classification. Also, for brevity, the term "proximate" is substituted for the words fundamental, direct, or necessary. Therefore, "proximate" function means that similar processes or structures that achieve similar results by the application of similar

natural laws to similar substances are considered to have the same fundamental utility and are group ed together. Our current system provides a single collecting area for all heat exchange devices, e.g., milk coolers, beer coolers, etc. Once collected into this single area, the art is further subdivided on features essential to heat exchange devices.

The term "utility" refers to (1) the function that a process, structure, or composition can perform; (2) the effect of a process, structure, or composition; or (3) the product that is produced by a process, structure, or composition. The proximate function, when used as a basis for classification, is generally applied to a process, structure, or composition for performing general operations in which a single causative characteristic can be identified and which requires essentially a single unitary act, e.g., agitating, cutting, heating, filtering, etc.

3. Effect or Product

This rationale collects art into industrial or trade groupings based on the result produced by the art. This result may be tangible (e.g., the product of a manufacturing process) or intangible (e.g., the communication of sound at a distance). In the mechanical and electrical fields, this method of grouping is generally reserved for complex processes or structures requiring successive manipulations involving plural acts, e.g., telephone system, shoemaking machine, etc. In the chemical fields, processes involving chemical reactions often are classified on the basis of the product produced.

4. Structure

Simple subject matter having no apparent functional characteristics is classified based upon the structural configuration or physical makeup of the object. This situation rarely arises with respect to the creation of a large group or class in mechanical fields, but frequently occurs with

respect to subdivisions within such group or class.

A chemical compound is always classified on the basis of structure and a stock material is often classified on the basis of structure; that is, on the basis of the components and the component arrangement, regardless of their utility. Also, mixtures or compositions are classified on the basis of structure or components when possible, e.g., in the case of alloys and colloids. Whenever this is not practical, the compositions are generally collected on the basis of the disclosed utility for the particular material.

B. Search System Organization

The following description is a brief overview of the U.S. Patent Classification System. This description will acquaint you with terms and phrases used in the handbook. Many of these terms and phrases will be explained in greater detail later in this handbook.

A fundamental principle of the U.S. Patent Classification System is that each class, or part thereof, is created by first analyzing the claim disclosures of the U.S. patents and then creating various divisions and subdivisions on the basis of that analysis rather than by making a theoretical arrangement or ordering and then attempting to place the patents into the arrangement.

In the U.S. Patent Classification System, all similar subject matter is gathered together in large groupings to create classes. These classes are then subdivided into smaller searchable units called subclasses. The sequence or pattern arrangement of the subclasses within each class is called the class schedule.

Each class and its subclasses, with the exception of the design classes, is given a title and a definition. The title and definition of any subclass in a class schedule must always be interpreted as being further restricted (a) by the title and definition of the class and (b) by the title and definition of any subclass or subclasses under which it is indented (see the Manual of Classification, page I-2).

The bulk of patent documents stored in the U.S. Patent Classification System are U.S. patents. These documents are designated as either "Original" or "Cross-Reference" placements.

The "Original" classification is always based on the claims in the patent and is the primary classification assigned to any patent. Also, patents designated as "Originals" are used to define the content of a subclass as well as to determine where newly filed applications are best assigned for examination.

A "Cross-Reference" placement is an additional copy of an "Original" patent that has been added to a different subclass in the system. Refer to sections V and VI, in this handbook, for more information on this subject.

The U.S. Classification System also contains a large number of foreign patents and pieces of non-patent literature. The procedure for classifying foreign patents or documents in the system is simpler than the procedure for classifying U.S. patent documents. Total disclosure is generally used in classifying these documents.

Specific search tools are used to access information contained in the system. The following discussion will provide detailed information on these tools and their use.

II. AIDS TO SEARCHING OR PLACEMENT

The procedures used to make an accurate and efficient search or to classify a patent document require familiarity with and use of the following search tools:

- The Index to Classification
- The Manual of Classification
- Class and Subclass Definitions
- Classification Orders
- Automated Patent System (APS)

A. Index to Classification

The Index to U. S. Patent Classification is used to locate clues to the classifications of specific subject

matter. The Index contains an alphabetical listing of technical and common terms representative of arts, processes, machines, manufactures, compositions of matter, etc., along with a numerical reference citation to a segment (e.g., class or subclass) of the system in which pertinent patents or literature (prior art) have been placed and can be found. The reference citations obtained by using the Index are not exhaustive and only serve as a guide to the schedules, or portions thereof, of the identified classes. The definitions and notes associated with these classes or subclasses must be reviewed for more precise information on the location of relevant art. This is true even though the reference citation given by the Index appears to state a restricted area of subject matter. Also, synonyms can be used to locate an entry in the Index.

B. Manual of Classification

Some general knowledge of the classification system is necessary for the effective use of the Manual of Classification. It contains: (1) a collection of the class schedules, that is, an arrangement of the subclass titles and numbers in an organized order under each class title; (2) a list of the class titles in numerical order by class number; (3) a list of the class titles in alphabetical order; (4) a list of the classes by Examining Groups, and (5) a theoretical organization of classes into major groups, and within each group, an attempt to list the hierarchy of classes to represent a relationship for all applied sciences.

Class and subclass titles are used to identify major and minor segments of the classification system, respectively. These titles are brief and suggestive as possible about the subject matter contents covered by each segment. Therefore, it is best not to depend upon class and subclass titles, alone, to delineate the subject matter in a class or subclass. Reference to respective definitions and notes is essential. If a search or placement is to be expeditious, accurate, and complete, the Manual of Classification should be used only as a key to the class or subclass definition and appended notes.

C. Class and Subclass Definitions

The review of class and subclass definitions is essential to properly place a document or to obtain a proper field of search. Each definition consists of a statement of the scope embraced by the respective segment of the system that it delineates.

A subclass definition must be read in light of the class definition and any parent subclass definitions from which it depends. Many of the definitions have accompanying notes. These notes are usually (1) notes that supplement definitions by explaining terms or giving examples and (2) notes that refer to related disclosures located in other classes or subclasses.

The latter notes are termed search notes and are helpful in qualifying and explaining the limits of a class or subclass. They generally state the relationship to, and difference from, other identified subject matter collections. For any search or patent placement, each note provided should guide a user to the extent necessary to reach a decision either to include or exclude an area containing relevant subject matter. Similar notes under the class definition, as well as any parent subclasses from which a subclass depends, should also be used as a guide in reaching this decision. The definitions and notes of each revised class are published in separate bulletins which are identified by the class number and title.

D. Classification Orders

New classification orders are issued throughout the year and contain information relating to U. S. patent classifications that are established or abolished as a result of reclassification projects. They are used to bridge the gap between the time a project(s) issues (when the change is officially made) and the time that regular search tools are updated to include new information.

The following search tools are included in a classification order:

1. Either the new class schedules or changes to existing class schedules impacted by the project

2. Changes to the definitions necessary to support the changes in 1, above

3. Source and disposition lists showing how art from abolished subclasses have been placed into newly established subclasses

4. Revisions to the International Patent Classification (IPC) Concordance showing the relationship between newly established subclasses and their IPC counterparts.

A "Reclass Alert Report", which is issued quarterly, summarizes changes which resulted from Reclassification Orders and notifies examiners of issuing classification projects. If you need a copy of a classification order, contact your Group Post Classifier.

See subheading E, below, for a discussion on how to use the Automated Patent System (APS) to find the locations of new classes and subclasses of art classified in an abolished subclass.

E. Automated Patent System (APS)

The APS can be used to access the on-line database that contains the full text files for all of the U.S. patents issued since 1975. Pertinent classifications for a particular subject matter can be determined by conducting a term search of the full text file (or portions thereof, such as titles or abstracts) and then using the SELECT command to display and rank the classifications of the resulting patents.

The APS can also be used to determine the new location of art classified in a subclass which has been abolished due to a reclassification project. By searching in one of the Issue Classification Indexes (e.g., /ICLS,/IOR, etc.) for the abolished subclass, the new class and subclass location can then be determined by using the SELECT command.

See the APS Text Search and Retrieval Reference Manual for a detailed discussion of related APS commands and indexes.

III. PATENT ANALYSIS FOR PLACEMENT INTO SYSTEM (CLAIMED DISCLOSURE)

As previously mentioned, U.S. patents constitute the bulk of documents in the U. S. Patent Classification System. Therefore, class schedules are created and developed by considering the informational content of patents in the area of technology that a class is intended to serve.

However, the disclosure of a patent is usually multifaceted and such disclosure is susceptible to varied analysis. To ensure reasonable uniform placement of patents and to provide for "infringement" type searches, the claimed subject matter interpreted in light of the total disclosure contained in a patent has been selected as the primary basis upon which the informational content of the patent is considered. This narrows down to manageable proportions the subjective judgments that must be made relative to the uniform placement of patents.

In as much as the total disclosure of a patent may include unclaimed subject matter of value, adequate provision is made for including unclaimed subject matter in the system by cross referencing (see Section VI, below). It must be emphasized that not every item of information included in every patent can or should be provided for. Generally, only unclaimed subject matter characterized as (1) new, (2) uniquely set forth to facilitate recognition, (3) particularly illustrative of significant details or relationships, or (4) providing helpful background or explanatory material, is considered to warrant the placement of additional copies in appropriate subclasses for such subject matter.

This being said, the first step in the process for determining (a) the proper assignment of an application for examination, (b) a proper field of search, or (c) the required or "mandatory" classification(s) for an issuing application is to determine precisely what is being claimed.

Each claim in an application or patent must be reviewed to determine which elements or subcombinations are embraced by that claim. Dependent claims frequently add additional subcombinations or elements to the organization claimed in its parent or independent claim. These additional subcombinations or elements could well affect the field of search and application assignment or classification upon issue.

IV. DETERMINATION OF A CLASS FOR ORIGINAL CLASSIFICATION OR ASSIGNMENT FOR EXAMINATION

When the content of each claim has been analyzed, it may be found that the patent or application includes two or more claims which are drawn to diverse subject matter (i.e., they are classifiable in different classes).

For search and retrieval purposes, merely placing a copy of the document in each class would suffice. However, for both administrative and legal purposes within the U.S. Patent and Trademark Office (e.g., ensuring the examination of patent applications by the best qualified examiner on the subject matter, restricting patent applications to properly related inventions, interference or infringement searches, etc.), there is a need to designate for U.S. patents a primary or "original" classification. All other classifications are designated as cross-references, and the corresponding patent copies are so labeled or stamped at the top of the cover page. The following selections relate to the basis on which the "original" class is chosen or how applications having multiple claimed inventions are assigned.

A. Original Placement Between Classes

The process for selecting the claimed invention that will control original classification or assignment designation is effected by considering in turn the factors listed below:

- Selection of the most comprehensive claim;
- Selection among statutory categories of subject matter when claims are of equal comprehensiveness;
- Selection among superiority of types of subject matter; and
- Selection among classes in "related subject" listing.

1. Selection of the Most Comprehensive Claim

The claimed disclosure setting forth the most comprehensive organization (for example, a claim to a combination as compared to a claim to a

subcombination or element of that combination) will control placement of a patent or application among classes. This is illustrated by comparing the following two claims (which not only differ in comprehensiveness, but also are directed to different categories of subject matter) each of which define subject matter properly classified in a different class:

Claim 1. A laminated sheet comprising two panels of aluminum bonded with an intermediate layer of a binder, said binder comprising an elastic, self-vulcanizing rubber-like cement, the adjacent faces of the panels being roughened in a cross-hatched pattern to facilitate adhesion of the cement, two opposite edges of the sheet being notched with corresponding, interfitting dovetail cutout portions to facilitate securing the edges one to the other.

Claim 2. A process comprising scoring the faces of two aluminum panels in a cross-hatched pattern, applying a binder to the scored faces, pressing the coated faces together to secure the panels and forming a sandwich and then bending the sandwich and securing the opposite edges to each other to form a tube.

Claim 1 encompasses a product comprising a laminated sheet. Claim 2 encompasses a process of making such a sheet, but includes the step of bending the sheet and securing the edges to form a tube. Process claim 2 thus contains a greater extent of subject matter than does Claim 1 and is therefore more comprehensive. Assuming that separate classes provided for the subject matter in Claim 1 and 2, respectively, a patent with these two claims should be placed as an original in the class providing for the subject matter of Claim 2.

2. Selection Among Statutory Categories of Subject Matter

When a patent includes separate claims to two or more different statutory categories of subject matter and none of the claims is more comprehensive

than the other(s), placement of the original is in the class providing for the claimed category which appears highest in the following list:

1. Process (of using product 2, e.g., using a fuel or radio transmitter)
2. Product (of manufacture, e.g., a fuel or radio transmitter)
3. Process (of making product 2)
4. Apparatus (to perform 3 or to make 2, e.g., machine, tool, etc.)
5. Materials (used in 3 to make 2)

For example, when considering claims to a radio transmitter (category 2) and to a process of manufacturing the same (category 3), the claim to the transmitter would control class assignment. Similarly, a claim to a process of using the transmitter (category 1) would control over a claim to the transmitter or process of making it.

Modern patent classification schedules often separate statutory categories of related subject matter into different classes or if several categories are included in the same class, put them in different groups of subclasses, frequently in the priority given above.

3. Selection Among Superiority of Types of Subject Matter

a. Chemical subject matter

b. Electrical subject matter

c. Mechanical subject matter

(1) Dynamic (relates to moving things or combinations of relatively moving parts)

(2) Static (stationary things or parts nonmoveably related)

4. Selection Among Classes in "Related Subject" Listing (Last Resort Only)

The number of a class, generally, has no significance insofar as superiority of one class relative to another. The class number is a mere mark of identification which has been assigned arbitrarily. Nor is the class listing included in the "Classes Arranged in Alphabetical Order" in the Manual of Classification an order of superiority. The title of a class is an accident of language and varies from one language to another. However, a theoretical organization of the applied sciences into three major areas is published in the front of the Manual of Classification and is titled "Patent Office Classes Arranged by Related Subjects." Within each of the areas the classes have been listed in a hierarchy suggesting an order of superiority.

Some class positions in the listing show superiority very well, whereas others show it less or not at all. Notwithstanding, as a last resort, where the other bases for selection discussed above cannot be applied, a controlling claim is sometimes selected according to this listing. The controlling claim is identified as the one having subject matter provided for by the class which appears highest in such listings.

5. Exceptions

Class definitions must be read for possible exceptions to the selection procedures discussed above inasmuch as disclosures in a given area of technology may have required deviation from these procedures. Any deviation will be mentioned, and explained, in a modern class definition.

The procedures outlined above presume that the class in which each claimed invention is classified is known to the person reviewing the claims. The following section offers suggestions on how to determine which classifica-

tion is most appropriate for any claimed invention where the class is not known.

V. SELECTION OF LOCUS FOR SEARCHING OR PLACEMENT

The following suggestions are offered for selecting a class whenever the appropriate class for a particular claimed invention is unknown. These suggestions should be applied to each claimed invention.

A. Selecting a Class

1. Index to the U.S. Patent Classification

Reference to the Index to the U.S. Patent Classification by patent title, a key word of the title, a synonym thereof or any other descriptor of the claimed disclosure should provide one or more clues to particular classes (and often subclasses) relating to the subject matter involved. Caution should be used with respect to the subclass(es) indicated under any heading (see Section V, B).

2. Patent Office Classes Arranged by Related Subject

Reference to "Patent Office Classes Arranged by Related Subjects" beginning on page I-5 of the Manual of Classification is often the best method of making an initial determination of the pertinent class(es).

3. Alphabetic or Numeric Listing of Classes

Reference to the alphabetical or numerical listing of class titles in the Manual of Classification may provide the necessary clue to the proper class.

4. Automated Patent System (APS)

A term search of the text along with using the SELECT command to display and rank the classifications of the resulting patents can help determine the proper class. See section II,E, above for a discussion of APS features which may be useful in determining the proper classification in which to search or place a patent.

5. Subclass Titles

A quick scan of the subclass titles in a class suggested by suggestions 1-4 above is often very helpful in a first approximation of the pertinence of such a class to the subject matter being considered.

In every case, the definition of the indicated class must be checked to verify the propriety of the proposed class selection. This selection requires that a class, as defined and further explained in the class notes, encompass claimed disclosure to the exclusion of other classes. Usually, the definition and notes of a class indicate where related subject matter is provided for and also set the lines of demarcation between and among such related subject matter. It should not be necessary to squeeze or "shoehorn" a patent disclosure to make it fit a particular class definition.

6. Exceptions and Caveats

a. Unless the definitions specify otherwise, a claim to an article of manufacture (a box for Class 229) distinguished solely by the composition or stock material from which it is made (a particular form of corrugated paper for Class 428) is placed in the appropriate composition or stock material class--contrary to the selection procedure set out above.

b. A single claim to a hybrid of categories (such as a product defined only by a process) is occasionally encountered in a patent or application. Under these circumstances, an application may be assigned to the proper process class for purposes of examination. If allowed, the claim should be classified in the proper product class and a cross-reference copy may be placed in the process class where the application was examined.

c. Notes for the class definition of the class providing for a combination should be read for

possible exception where the claimed disclosure is to a "nominal" combination. A nominal, or named, combination refers to a combination wherein one or more of the parts or steps thereof are recited so broadly, and without details, as to constitute a mere identification rather than a description of each part or step.

d. It frequently happens that an application will be received which claims too much for placement in either an element or a subcombination class but does not claim enough subject matter to clearly meet the requirements of a combination class. In these instances, assignment will generally be made to the class providing for the larger organization, i.e., the combination class, instead of assigning it down to the lessor organization, i.e., the element or subcombination class.

e. Where the historical placement of patents having a particular claimed disclosure has been contrary to written definitions and notes, this will override all other considerations and will control placement of like subject matter until such time as corrective reclassification is effected.

B. Selecting a Subclass Within a Class

After determining the most appropriate class to search or place a particular claimed invention, then determine which subclass best provides for the concept in question.

Use the following procedures to select a subclass that is applicable to each individual claim in a patent or application (e.g., each claim must be considered separately for classification or search purposes). A separate, mandatory classification is required for each claim which is classifiable in a different subclass. Likewise, each claim in an application should be considered separately to determine all critical search locations.

Before beginning a discussion on subclass selection, agreement is needed on the meaning of certain terms and phrases. The following schedule is a hypothetical system to sort and classify scrap in a junk yard. It will be used to help define those terms and phrases.

```
 1   COMBINED BAR, LINK AND BALL
 2   COMBINED BAR AND LINK
 3   COMBINED BAR AND BALL
 4   COMBINED LINK AND BALL
 5   CHAIN
21   . With end fastener
22   . With flaccid cover
23   . . Removable
 6   BAR
 7   LINK
 8   BALL
 9   . Hollow
10   . . Perforated
11   . . Grooved
12   . Perforated
13   . Grooved
14   . Mineral
15   . . Metallic
16   . . . Aluminum
17   . . . Zinc
18   . Rubber
19   . Ivory
20   MISCELLANEOUS
```

The above schedule is similar to an outline used to write a term paper or the like. Each indented heading (subclass) further qualifies the heading (subclass) under which it is indented and, consequently, must be read as including all of the limitations of the superior heading (subclass). For example, subclass 10 is read as a perforated hollow ball and will only accept items having at least these attributes. The qualifier "at least" is used deliberately. The reasons for this qualification are explained below.

Subclass titles that do not have a dot imposed between the title and numeric designator for the subclass are referred to as a "Main Line" or "First Line" subclasses, e.g., subclasses 1, 2, 3, 4, 5, etc. Indented subclasses are referred to by the level of indentation. Subclasses

indented one level below a "Main Line" subclass are referred to as a "Second Line" subclass, e.g., subclasses 21, 22, 9, etc. Subclasses indented one level below a "Second Line" subclass are referred to as a "Third Line" subclass, e.g., subclasses 23, 10, and so forth. All subclasses indented under a superior concept are generally referred to as that concept's "indents".

Subclasses positioned at the same level of indentation are also referred to as "coordinate" subclasses, provided that a superior subclass is not located between the subclasses being compared. While subclass 21 and 22 are coordinate with respect to each other, subclasses 22 and 9 are not, even though they are both "second line" subclasses, since subclasses 6, 7, and 8 intervene between these two subclasses. All "First Line" subclasses are coordinate with respect to each other since nothing can be superior to a "First Line" subclass.

1. Schedule Order

The order in which a subclass appears in the schedule establishes the order of superiority between the concepts provided for in the schedule. The number assigned to a subclass title has no importance other than to provide an address for the storage area in which the art physically resides. The location of the subclass title within a schedule hierarchy is paramount.

In a modern schedule, all subject matter is hierarchically arranged with the subclasses which embrace the largest organization of elements, i.e., the most complicated structures provided for in the class, usually appearing higher in the schedule than simpler subject matter. The above schedule example shows this type of arrangement. The organization of a bar, plus a link and a ball (i.e., subclass 1, which is the largest assemblage of elements) appears higher in the schedule than the lesser assemblages of a bar plus a link, or a bar plus a ball or a link plus a ball. The simplest elements (e.g., bars, links, and balls) are found even lower.

The modern schedule is also usually characterized by the placement of a "MISCELLANEOUS" subclass at the end of the schedule, see subclass 20 in the previous example. Also, it will frequently have a "COMBINED" subclass located about midway down the schedule's length.

The "COMBINED" and "MISCELLANEOUS" subclasses are similar in character. The "COMBINED" subclass acts as a miscellaneous collecting point for the basic subject matter of the class combined with subject matter provided for in another class when such combinations are not specifically provided for higher in the schedule. The "MISCELLANEOUS" subclass collects all subject matter properly placed below "COMBINED" for which no specific subclass is provided.

See Appendix A for further discussion of the details of a modern schedule.

As noted earlier, the classification system as it exists today was created within the last 100 years. Vestiges of older systems are still present in the system and it is important to distinguish the older classes from the modern classes since the classes were created using a different theory of schedule structure and art placement. When using the older classes, adjust search and placement strategies accordingly.

In older classes, the "MISCELLANEOUS" subclass will almost always appear as the first subclass in the schedule array. In this position, the "MISCELLANEOUS" subclass assumes the function of both the "COMBINED" subclass and the "MISCELLANEOUS" subclass in the modern schedule. It provides a home for all unprovided for materials admitted to the class by its definition. It, therefore, accepts unprovided for combinations of the basic subject matter of the class and structure provided for in other classes, unprovided for basic subject matter, and unprovided for subcombinations or elements found in the class. When placing a document or conducting a search in an older class, visually scan the main lines below "MISCELLANEOUS"

to see if any provide for the subject matter in question. If no subclass is found, placement in "MISCELLANEOUS" is the proper locus.

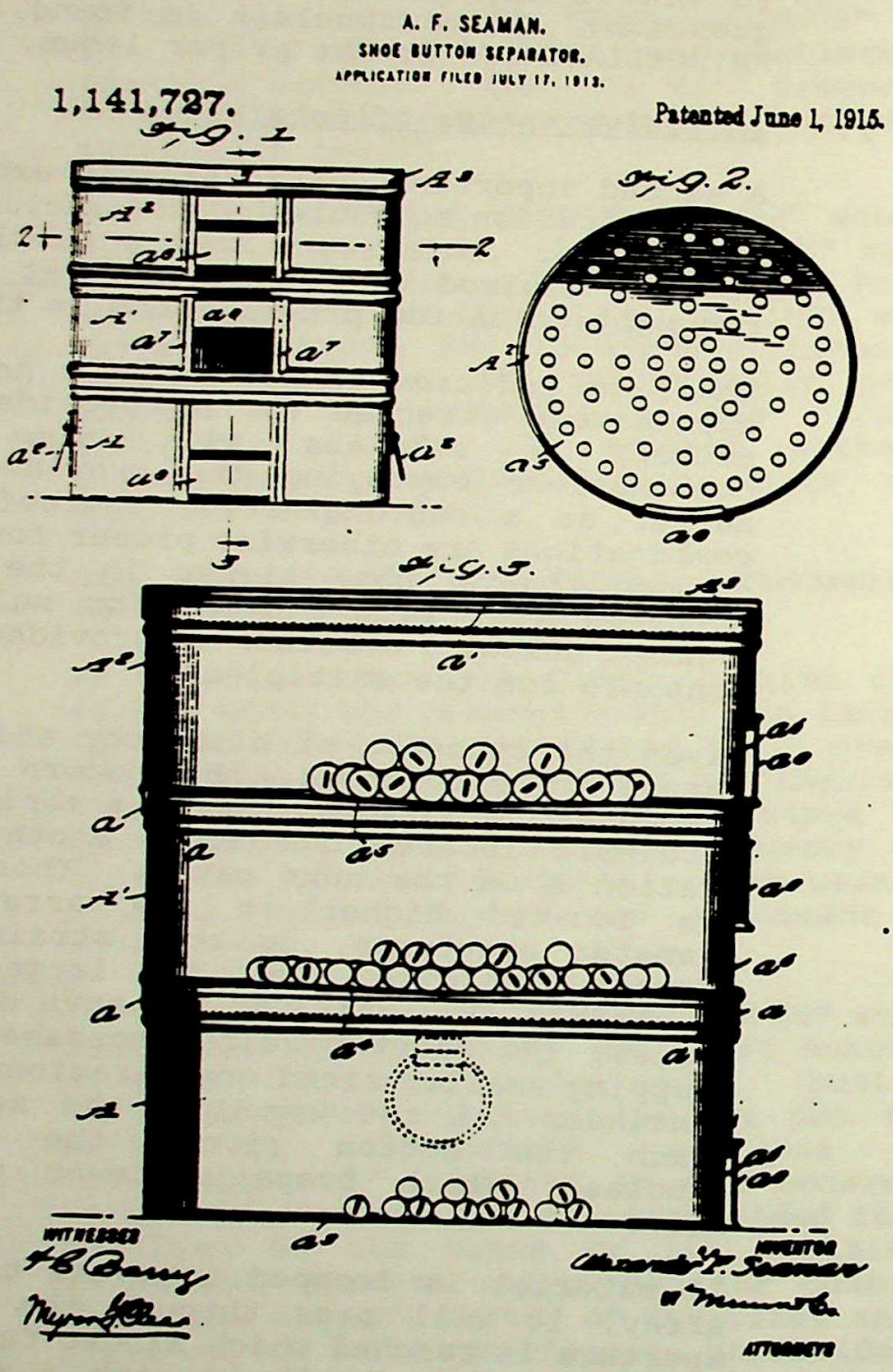
2. Inclusive Nature of Subclasses

A second important characteristic exhibited by the classification schedules is the inclusive nature of subclasses. This means that a subclass is proper for any claimed disclosure that at least recites the subject matter provided for in the subclass.

Thus, in addition to providing a home for claims exclusively directed to the provided for subject matter, a subclass will also accept all combinations employing the provided for subject matter as a subcombination thereof provided the combinations are otherwise proper for the class and do not find a home higher in the schedule. A subclass will also provide for multiples of the concept unless a subclass is provided higher in the schedule for the multiples.

Given the concepts of hierarchy and the inclusive nature of subclasses, the modern classification schedules can be viewed to be a series of sieves or strainers located one above another (see Illustration A on the next page). Those sieves which are located higher in the array have larger diameter apertures, so they strain out only the largest particles, i.e., the largest organization of claimed elements. As you move down through the series, the aperture size decreases, consequently trapping smaller sized organizations. This process continues all the way down the series until you reach the bottom (i.e., the "MISCELLANEOUS" subclass) which traps whatever was not caught above.

If material is dropped into the top of the sieve array, it will pass through the array until an aperture is reached which blocks further passage of the material. So it is with a modern classification schedule. When placing or retrieving (i.e., searching) a concept using a schedule, start with the first subclass in the class and proceed to move


A. F. SEAMAN.
SHOE BUTTON SEPARATOR.
APPLICATION FILED JULY 17, 1913.

1,141,727.

Patented June 1, 1915.

Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES

INVENTOR

ATTORNEYS

Illustration A

down through the "First Line" subclasses until one is found that will accept any claimed subject matter. This subclass exhausts the claimed subject matter and all concepts employing this subject matter. No lower "First Line" subclasses should have to be looked at in the schedule for this subject matter.

Since subclasses are inclusive, once an appropriate subclass has been selected, consideration of subclasses located higher in the schedule than the one selected may be necessary. To illustrate, refer to the junk yard example on page 18. Suppose, sorting through a pile of junk, a bar is discovered and a decision about which bin to store the bar in must be made. Consulting the schedule, starting at the top and scanning down, it is noted that subclass 1 provides for bars, but the bars must be combined with other elements, i.e., links and balls. Unless at least all three are present, classification in bin 1 is not proper.

If there is only a bar itself, then subclass 1 is not the proper placement for the bar. Subclasses 2 and 3 also provide for a bar. As noted above, the bar is combined with some other feature, i.e., a link in one case and a ball in the other. The first subclass that will accept a bar by itself is subclass 6. Accordingly, you would assign the bar to bin 6.

Now, suppose after a few months, some one comes in looking for a novel bar. It is known from previous experience that bars, per se, are in bin 6 and that in the classification system the subclasses or bins are exhaustive of their subject matter. Consequently, if the junk has been properly sorted, there is no need to look in any bin number that appears lower in the schedule than bin 6.

What about higher subclasses? Well, subclasses 1, 2, and 3 all include bars as part of their organization. In order to be sure that all bars have been seen, then look into those bins also.

Finally, once a subclass has been selected, all of its indents must be investigated, if any, to be sure that one of them does not provide more fully for the subject matter under investigation. The processes to be used will be discussed below under the heading of "General Methodology". Also, it is imperative that the subclass definition and any notes attached to it are read to be sure that there isn't an exception made to the general rule of the inclusive nature of subclasses. Such exceptions do occur and care must be taken to avoid wasting time and effort.

3. Additional Types of Art Collections

a. Digest

A digest is a collection of cross-reference copies of patents created by an examiner which is based on a concept which relates to a class but not to any particular subclass of that class. Digests are "outside" of the official classification arrangement and are listed in numeric sequence at the end of each class schedule. Digests are not defined and are not available in the public search room file. A digest may be created only as an interim measure during a reclassification project, and it must be converted to either an official subclass or a cross-reference art collection when the project issues.

b. Cross-Reference Art Collection

Cross-reference art collections differ from digests in that the material involved in the art collection is defined to some degree and the patents are available in the public search room. Some art collections include indentation levels. Placement in these areas is intended to follow official patent placement procedures. Art collections are usually listed in numerical sequence at the end of each class. In most classes, subclass numbers 900 - 999 are reserved for art collections.

c. Unofficial or Alpha Subclasses

Over the years, Patent Examiners have created alpha subclasses (sometimes called "unofficial" subclasses) to facilitate searches within the arts under their jurisdiction. In this process, a grouping of patents is selected from an existing numeric subclass and then collected in a new indented subclass with an alpha designation following the official numeric designation. Since the original subclass no longer has all the patents officially classified therein, it is given the alpha designation "R" (indicating residual). It should be noted that the numeric subclass located in the Public Search Room equates to the residual subclass plus any unofficial alpha subclasses indented thereunder. There are no definitions for the alpha subclasses, nor is it contemplated to define these subclasses beyond the context of the titles and the definitions of the subclasses from which the were formed (and which are now "R" subclasses). The indented alpha subclasses are positioned in their proper hierarchial location in the schedule (i.e., immediately above the next subclass having an indent level less than or equal to the "R" subclass. These art collections are offered only to the extent they may be helpful as a search assist and should not necessarily be considered to be a completed collection of the art represented by the title. As with digests, alpha subclasses may be created only as an interim measure during a reclassification project, and must be converted to official subclasses when the project issues.

4. General Methodology

a. To reiterate, once the proper class is identified, it is necessary to select the proper subclass by scanning down the schedule of the class from the first appearing subclass toward the last. Only first line subclasses (all

fully capitalized titles) are considered on the initial scan. Each first line subclass is evaluated (title checked against the definition, if necessary) until a first line subclass is reached that provides for that claimed disclosure. When a first line subclass cannot be selected using the claimed disclosure, the claim is classified in either the "COMBINED" or the "MISCELLANEOUS" subclass --even if a subclass can be selected using the total or unclaimed disclosure.

b. If such a first line subclass has coordinate subclasses indented thereunder, these indented (second line) subclasses must in turn be scanned and evaluated individually to determine the first or highest subclass, if any, which provides more specifically for the claimed disclosure (see the heading for Placement Within Alpha Arrays, below).

c. If such an indented, second line subclass itself has coordinate indented subclasses, repeat the above process until the ultimate indented subclass is reached that provides for the claimed disclosure.

5. Indenting by Total Disclosure

After determining the placement of a particular subclass solely on claimed disclosure, in most cases, consideration must still be given to the total disclosure in connection with placement in further indented subclasses (if any). There are generally two forms of subclass or schedule array, each of which exhibits a different pattern of patent placement in the indented subclasses of the respective array. The selection procedure for each form is set forth below. See Genus-Species Rule and Placement of Markush Type Claims headings, below, for the rule pertaining to the placement practices in chemical schedules.

6. Combination-Subcombination Rule

The following fragment of a schedule is used to illustrate a typical combination-subcombination relationship among subclasses.

253 ROLLING MEANS TO FORM SHEET OR STRIP
255 . With corrugating means
254 . With treating means
256 . Roll coacting with planar platen
257 . . Reciprocating platen

Here, the first line or major subclass (253) is a subcombination of subclasses indented thereunder. That is, subclasses 255 through 257 are greater combinations than are provided for by the parent subclass 253. But subclass 253 is also inclusive of its own subject matter in combination with other subject matter not provided for in subclasses 255-257.

A patent which is otherwise proper for subclass 253, by the procedures relating to claimed disclosure set out in section V,B,4 (a-c) above, would in fact be placed in one of the indented subclasses 254-257 if the total disclosure included limitations of the indented subclasses. For example, a patent claiming a roll mill for strip forming and also disclosing means to corrugate said strip would be placed in subclass 255.

When further disclosure meets the term of an indented subclass such as 256 and also the still further indented subclass 257, the patent is placed in the appropriate ultimate indented subclass.

In addition, when further disclosure meets the terms of two or more indented subclasses which are coordinate with each other (as 255 and 256), the patent is placed in the first of said coordinate subclasses.

A patent having a claim to subject matter of subclass 253 and a disclosure for subclass 256, but also including a claim to a combination not provided for under subclass 253, is placed in

subclass 256 regardless of the presence of the claim to the unprovided for combination. Therefore, a combination not provided for or subcombinations encompassed by the subclass 253 title and the definition must be searched in the parent subclass (253) and all indented subclasses thereunder (255-257). However, a search to a combination provided for by an indented subclass is limited to that subclass, and the preceding coordinate subclasses. As a practical matter, most Examiners and Classifiers have adopted the practice of placing a cross-reference copy in the parent (or subcombination) subclass when the patent contains a claim to an unprovided for combination, particularly where the number of indented (or combination) subclasses is excessively large.

7. Genus-Species Rule

The genus-species rule assumes that each species subclass is mutually exclusive of all other species encompassed by their generic subclass. Therefore, in many class schedules exhibiting a genus-species relationship, a variant to the above combination-subcombination rule is followed.

In a genus-species subclass array when plural species are indented under the generic subclass, placement is on the basis of total disclosure where only generic claims appear in a patent having disclosed species. A patent having genus claims only, but disclosing provided for species, is placed in the first appearing disclosed species subclass.

A patent having genus claims only and a disclosure to an unprovided for species is placed in the generic subclass, the generic subclass is the first appearing subclass that can take the unprovided for species.

For example, in the following subclass array:

1 Generic subclass (SPRING, e.g., Torsion, etc.)

2 . Subclass species A (Coil)

3 . Subclass species B (Leaf)

a. If a generic claim only is present with disclosure of species A and B, place the patent as an "Original" in subclass 2 (and XR it to subclass 3).

b. If a generic claim only is present with disclosures of species A and C (Torsion spring), place the patent as an "Original" in the generic subclass 1 (and XR it to subclass 2).

Stated generally, where in addition to the generic claim there is a claim to a provided for species, the patent is placed as an "Original" in that species subclass unless there is also a claim to an unprovided for species, in which latter case the patent is placed in the generic subclass.

For example, in the subclass array above:

c. If a generic claim as well as a claim to species A and a disclosure to species C is present, place the patent as an "Original" in subclass 2 (and XR it to generic subclass 1).

d. If a claim to species C is present as well as a claim to species A, place the patent as an "Original" in generic subclass 1 (and XR it to subclass 2).

In all of the above instances, place cross-reference copies in the appropriate subclasses. Thus, for a generic search to be complete, it must include the genus subclass and all indented species; a complete search for a provided for species need be made in only that species subclass; and a complete search of an unprovided for species

need be made only in the generic subclass. You must be aware, however, of the presence of species which are not mutually exclusive. In the example used above, assume the presence of a third indented species subclass entitled "Plastic" and located above subclasses 2 and 3. Since any of the other species (i.e., torsion, coil, or leaf) could also be formed from a plastic material, none are mutually exclusive with respect to the "Plastic" species. Therefore, a search for either the torsion coil or leaf spring should include the subclass entitled "Plastic". One final note: if the "Plastic" spring subclass were located at the bottom of the array, a search for a coil or a leaf spring would be confined to subclasses 2 and 3, respectively. This is due to subclass schedule hierarchy, and the exhaustive nature of subclasses, which was explained in this section, above.

8. Placement of Markush Type Claims

In some chemical applications or patents, as sanctioned by Ex parte Markush, 1925 C.D. 126, a "genus" claim may be set forth as a group consisting of certain specified materials. That is, when there is in fact no commonly accepted generic expression commensurate in scope with the materials recited (see MPEP 706.03(y)). An application or a patent may thus have a Markush "genus" claim with or without other claims to the specified materials, per se, and such specified materials being "species" of the Markush "genus". The same principles set forth above, with respect to genus-species array, govern the placement of applications or patents with Markush type claims. For example, given the following subclass array:

1 Generic subclass (organic compound)

2 . Species subclass (A) - ester

3 . Species subclass (B) - alcohol

a. When a Markush group is disclosed, but only claimed as "species A (ester)" and "species B (alcohol)", place the document as an

"Original" in subclass 2 and XR it to species B in subclass 3.

b. When a Markush group is claimed as "consisting of A (ester), B (alcohol), and C (ether)", place the original in generic subclass 1 and XR it to species subclasses 2 and 3. The individual members of the Markush group are treated independently and the member C is provided for only in the generic subclass 1.

c. When a Markush group is claimed as "consisting of A (ester), B (alcohol), and C (ether)", and there is also a claim to A (ester), per se, the original classification is to species subclass 2 with an XR to generic subclass 1 and to species subclass 3. That is, a patent having a claim to a Markush group is placed as an original in the genus subclass only when individual species are not claimed. The classification of the claimed species controls placement of the original.

9. Mixed Array (Genus-Species and Combination-Subcombination)

A subclass schedule which includes both combination subclasses and species subclasses indented under a common genus-subcombination subclass is categorized as a mixed array (see the list below).

1 SPRING (subcombination of a mechanism)

2 . Coil (species A of spring)

3 . Leaf (species B of spring)

4 . With Indicator (combination)

5 . With Lubricating Means (combination)

The following rules of placement have been used for mixed arrays:

a. When a combination or subcombination is claimed which includes a coil spring (A),

place the "original" in subclass 2. No XR is needed since by schedule superiority all subject matter, including A, should be in subclass 2.

b. When one claim includes a coil spring, plus an indicating means and a second claim includes a torsion spring (an unprovided for species) plus an indicating means, place the original in subclass 2 with an XR to subclass 4. All coil springs and combinations claiming a coil spring are in subclass 2 and all combinations, including an indicating means, not provided for in the preceding subclasses, are in subclass 4.

c. When one claim is to a coil spring plus an indicating means and a second claim is to a torsion spring, per se, place the original in the generic subclass 1, the subclass accepting an unprovided for species, with an XR to subclass 2.

d. When one claim is to a coil spring plus an indicating means and a second claim is to a torsion spring plus an unprovided for element Z, place the original in subclass 1 with an XR to subclass 2--as in c. above.

10. Placement Within Alpha Arrays

The alpha subclasses provide for original and mandatory classification. In the past, indented alpha subclasses were located directly under the subclass from which they were taken (i.e., directly under the residual or "R" subclass). This often caused confusion in determining a proper search field and in properly classifying a document. In an effort to avoid this confusion all indented alpha subclasses have been relocated to their proper position in the schedule hierarchy (i.e., immediately above the next subclass having an indent level less than or equal to the "R" subclass from which they were taken). Patent placement in indented alpha subclasses can now follow all normal rules of placement for official subclasses.

In the sample alpha array below, indented alpha subclass 273N was created from subclass 273R. If, after considering each two dot indented subclass under subclass 273R (i.e., subclasses 274, 276, 277, 278, 279, 281R, and 284.1), a proper classification has still not been found, then alpha subclass 273N should be considered.

```
273R  . Bituminous material or tarry residue
        containing
273N  . . . Nitrogen containing
274   . . With sulfurizing or sulfonating
        agent
275   . . . With filler, dye or pigment
276   . . Rock asphalt
277   . . Bituminous emulsion
278   . . With solvent or dispersing medium
279   . . With flux
280   . . . With filler, dye or pigment
281R  . . With filler, dye or pigment
281N  . . . . Nitrogen containing
282   . . . Fibrous containing
283   . . . Water containing
281N  . . . Nitrogen containing
284.1 . . Phosphorus containing
273N  . . Nitrogen containing
285   . Hydrocarbon containing
```

The user must be aware, however, that many old indented alpha subclasses may contain patents which were not consistently placed according to the rules of superiority. Also, since no definitions exist for any of the indented alpha subclasses, the user may have to look at the patents in each indented alpha subclass as well as the parent residual ("R") subclass to determine what type of subject matter is classified therein. In the example above, even though subclass 273N might seem to be the proper classification, consideration of subclass 273R would still be proper. Subclass 273N would not have a definition which might result in subclass 273R containing patents which might be relevant to the user's needs.

Proper patent placement into alpha subclasses is even more difficult when a series of alpha

subclasses is listed sequentially. Again, since definitions are not available and since it is not known whether official rules of patent placement have been followed in the past, a search in these areas could involve searching all of the alpha subclasses as well as the residual R subclass.

Originally, alpha subclasses were allowed to exist indefinitely. During the 1980's, large numbers of existing alpha subclasses were defined and converted to numeric subclasses. The creation of alpha subclasses is currently used only as an interim measure to more quickly provide the examiner with needed classification schemes, and are always followed by conversion to numeric subclasses.

11. Nonconformity in Practice

It is necessary to be on the alert for past diversity of practice respecting placement within a class based on disclosure. Thus, vary your search techniques to compensate for such diversity. Nonconformity has nearly always been of the following type:

a. In some cases, the combination-subcombination practice of carrying placement to an indented combination subclass has been extended unofficially to a genus-species subclass array. In such an instance, an unprovided for species, even when claimed, has been assigned to a subclass providing for another species which has also been disclosed. This has often been done with no cross-reference back to the generic parent subclass. When such a condition is known or detected, an unprovided for species must be searched in the parent generic subclass as well as all species subclasses indented thereunder.

VI. ORIGINALS VS. CROSS-REFERENCES

A. Mandatory Classifications

By determining the proper classification designation of

each claim in a patent separately, and then assigning the patent to each separate classification designation, you can be reasonably assured that the claimed subject matter contained in the patent is retrievable. Each such classification is a mandatory classification, and the original classification is selected from among the mandatory classifications as being the highest in the schedule (superiority) of the class containing the controlling claim (see section IV,A, above). The remaining mandatory classifications are designated as cross-references (XR) and the patent copies are so labeled.

B. Discretionary Classifications -

Also designated as cross-references are any number of additional classifications which are deemed appropriate by the classifier or examiner, within the guidelines set forth below. These cross-references may provide for disclosure not encompassed by the claims, or for claimed subject matter which may be useful in classifications other than the mandatory classifications determined by the placement procedures in section V. The question of what unclaimed subject matter should be cross-referenced, and where, must be left to the judgement of the classifier or the examiner familiar with the art. Since there is a presumption that unclaimed subject matter is not new, it may be of little value. However, this is not always true and much of this subject matter should be cross-referenced to make it available to a searcher. There are no exact rules. When, in the judgement of the classifier or examiner, the subject matter is useful and is disclosed in sufficient detail and clarity to be used as a reference, it should be cross-referenced.

1. Cross-References to any part of system

Unfamiliar subject matter should not be ignored. If a specific composition, electrical circuit, joint support, etc., is disclosed, it should not be assumed that it is conventional or not useful merely because it is not claimed. A classifier or examiner having experience in such unfamiliar art should be consulted to determine if a discretionary cross-reference would be useful.

2. Cross-Referenced Subject Matter Should Fit Subclass Definition

Subject matter to be cross-referenced to a subclass, should fit its definition. However, since the ultimate object is to aid the searcher, a large amount of discretion may be used.

3. Techniques Used to Limit Cross-Referencing

In creating the U.S. Patent Classification System, several techniques have been used to limit the amount of discretionary cross-referencing. These consist of (1) proper positioning of subclasses in a class schedule and (2) search notes.

a. Cross-Referencing Between Classes

The existence of a search note in the class definition of each of related classes generally precludes the need for discretionary cross-referencing. However, where a combination-subcombination relationship exists, a search note in the class definition does not preclude the need for cross-referencing a particular disclosure when a specific subclass for such disclosure is provided in a class other than that in which a patent has a mandatory classification. Also, a patent classified in a class providing for a subcombination (e.g., a machine tool chuck) should not be cross-referenced to a combination class (e.g., machine tool) solely on the basis of the subcombination.

b. Cross-Referencing Between Subclasses

The following general considerations apply to the placement of discretionary cross-reference copies:

When two subclasses (either in the same or separate classes) contain subject matter related in structure or mode of operation but which are separated on different functional bases, the provision of a search

note in each subclass referring to the other subclass precludes cross-referencing from either subclass to the other.

Two coordinate subclasses may have a combination-subcombination relationship with the subcombination subclass title consisting of the identical terminology of a portion of the combination subclass title, or a subclass indented thereunder. If a search note is provided note is provided in the subcombination subclass indicating that the combination subclass or the subclass indented thereunder must be searched when conducting a search for the subcombination, then no cross-references are made from the combination subclass, or subclass indented thereunder, to the subcombination. However, a disclosure of a combination in a patent placed in the subcombination subclass may be cross-referenced if it is believed to be useful.

When two coordinate subclasses have a genus-species relationship (the species subclass appearing first in the schedule), generally no cross-reference of such species is made to the genus subclass.

When there are two subclasses, the first of which contains a voluminous number of patents having disclosures directed to subject matter which could be cross-referenced to the second subclass but which fact is not evident from the titles of the subclasses, a search note is generally provided in the definition of the second subclass indicating that the first subclass must be searched and no patents are cross-referenced from the first subclass to the second subclass.

Generally, no cross-reference is made within a class when the relative schedule position of the subclasses involved indicates that a search for the disclosure would include both

subclasses.

In each of the above situations, it is quite common to find one or two cross-references, irrespective of the presence of a search note. This has frequently been done by classifiers to alert a searcher who may have overlooked the search note to a pertinent field of search.

c. Cross-Referencing Between a Parent Subclass and its Indents

The two most frequent types of relationship between a parent subclass and subclasses indented thereunder are (a) combination-subcombination and (b) genus-species.

(1) In the type involving the combination-subcombination relationship, the indented subclass is directed to a combination which includes the subject matter of the parent subclass as a subcombination thereof. Such a combination and a perfecting feature that is not specifically provided for is often accommodated by classifying the original in the indented subclass and by cross-referencing to the parent (subcombination) subclass.

(2) In the type involving the genus-species relationship, that is, where the parent subclass is directed to a genus and the indented subclass is directed to a species, usually there are no search notes therebetween, but cross-referencing may be made either from the genus subclass to an indented subclass or from an indented subclass to the genus subclass.

d. Search Notes in a Subclass Does Not Preclude Cross-Referencing in an Indent Thereof

A note in a first subclass indicating that a second subclass should be searched in

connection with a search for the subject matter of such first subclass, does not preclude cross-referencing of a patent from such second subclass to a subclass indented under such first subclass and directed to a specific variant thereof.

C. Original Designation

Only those patent copies labeled as "original" (OR) are accorded evidential value to construe titles, definitions, and notes. This is due to the fact that discretionary cross-references often reflect a great deal of subjective judgement on the part of a examiner or classifier, and there is no distinction made between mandatory and discretionary cross-references in the labeling of patent copies. Thus, for the purpose of (a) resolving differences as to placement of a patent application or a patent or (b) demonstrating separate classifications or divergent fields of search in an examiner's requirement for restriction, only patents placed as originals may be cited. There is no difference at all with respect to the reference value of an original and cross-reference patent.

ADDENDUM
Reclassification in Classes 518-585

Class 260, the class of organic chemistry, once contained the largest array of patent documents in the PTO. It was decided that this class needed to be reclassified because its concepts did not necessarily address new technology and several of its subclasses were too difficult to search because of their size.

Also, it was decided that a new format for reclassification should be adopted so that the results of reclassification projects could be used as soon as possible. In the past, a class was reclassified in its entirety; however, it is not practical to reclassify a large class like 260 in its entirety because it could take years before a newly created class and its subclasses could be published.

Consequently, the decision was made to segment Class 260 into a number of individual reclassification projects so that the results of these projects would be available for searches. Using this approach has resulted in the publication of several individual classes, within the range of Classes 518-585, to replace subclasses and concepts found in Class 260. Whenever subclasses are replaced in Class 260, the individual subclass areas are noted by a reference box in Class 260 to indicate the new search areas. Eventually, all of Class 260 will be reclassified and Class 260 will be abolished. Within the range of Classes 518-585, Classes 520-528 are considered the 520 series and Classes 532-570 are considered another series. These classes are considered independent classes even though the patents came from Class 260.

Within the newly established classes, the schedule hierarchy and placement superiority are indicated by the class number. For instance, Class 525 is superior to Class 528 and Class 544 is superior to Class 560. It is important to use these series as subclasses. The Class numbers merely indicate superiority of subject matter. Each class after 520 and 532 have been noted by upper case characters followed by a one dot indent level with a carry over on the top of the manual page indicating the appropriate series, i.e., 520, 532-570. The general rules of patent placement in section V,B,1, of this handbook apply to the 520 and 532-570 series.

Appendix A

STRUCTURE OF THE MODERN SCHEDULE

Over the years, the PTO has used many schemes to provide a framework that is uniform for the entire classification system as well as to provide schemes that optimize a class's usefulness as a search aid.

The current philosophy on the organization of patent data was formulated in early 1964 and set forth in the publication "Development and Use of Patent Classification Systems" (DUPACS). This publication was issued in January 1966 and is now out of print; however, a number of copies still exist in each group in the Examining Corps.

DUPACS sets forth a model (shown below) which should be used in the creation of a new classification system, i.e., a class. However, please be aware that this model is a theoretical standard and many deviations will be found in practice. The primary reason for these deviations is that all classes are built based upon a thorough review of the art to be contained in the new class. The structure of the class is dictated by the art itself. This review of the actual documents frequently causes modification of the theoretical model.

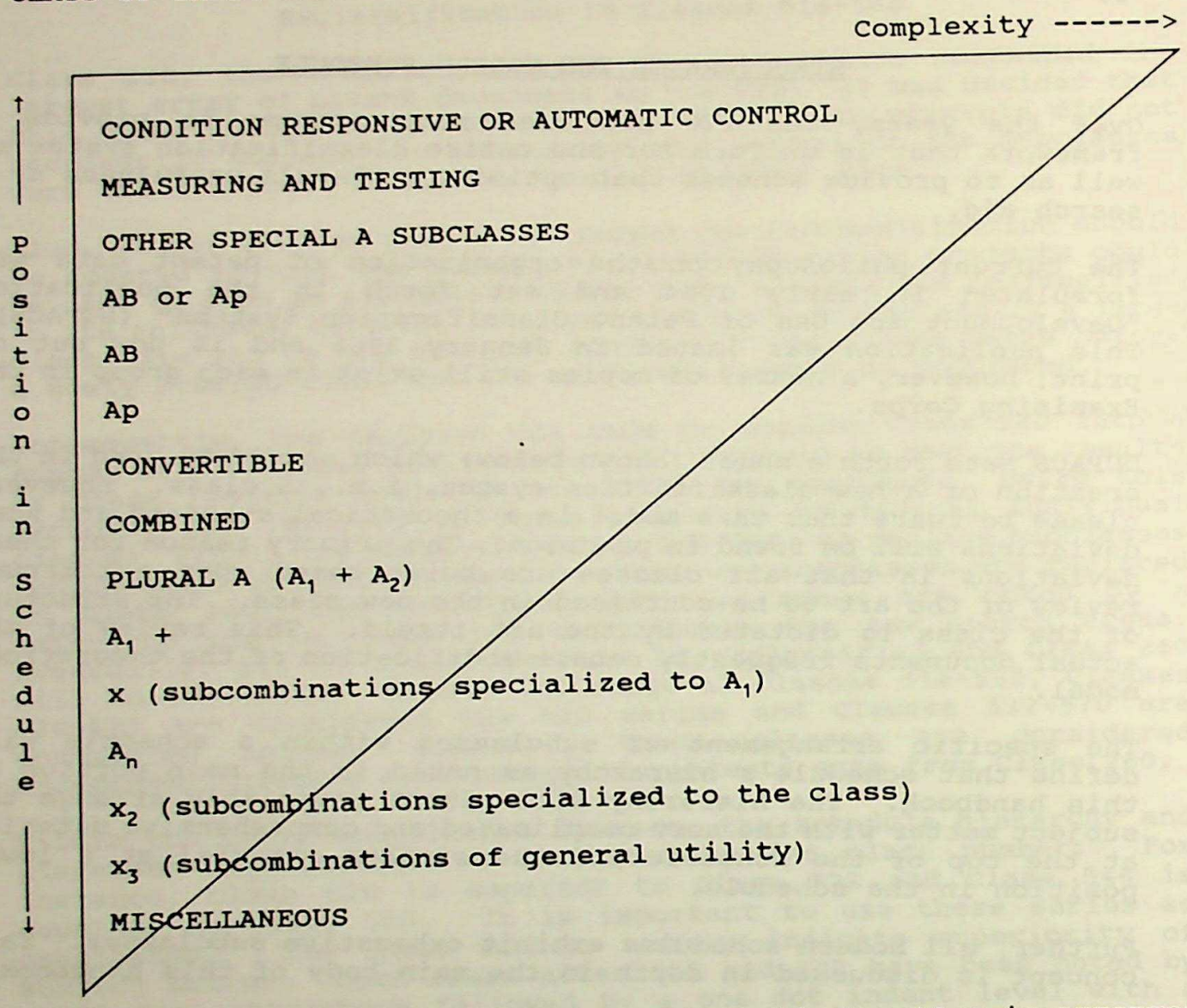
The specific arrangement of subclasses within a schedule will define that schedule's hierarchy as noted in the main portion of this handbook. The hierarchy will almost invariably arrange the subject matter with the most complicated and comprehensive material at the top of the schedule and the simpler material at a lower position in the schedule.

Further, all modern schedules exhibit exhaustive subclasses. This concept is discussed in depth in the main body of this handbook.

With these preliminary thoughts and reservations, a discussion about the preferred theoretical structure of the "Modern" class will now take place.

The "modern" class is often represented as an inverted right triangle.

CLASS OF BASIC SUBJECT MATTER A



As you can see in the above scheme, the subject matter is arranged from the most complicated (the top of the triangle) to the simplest (the bottom of the triangle). A, AB, Ap, and X are the four characters of subject matter in the above scheme. "A" represents the basic subject matter of the class, e.g., in a class of pumps, "A" would be the types of pumps found in the class (e.g., jet pumps, reciprocating pumps, etc.); "AB" represents the basic subject matter combined with subject matter having a different proximate function, effect, or product, that is, the subject matter

of another class (e.g., a pump combined with and driven by a vehicle); "Ap" represents the basic subject matter combined with a perfecting feature, i.e., some structure that enhances or improves the operation of basic subject matter device (e.g., an intercooler located between stages of a pump which improve the overall efficiency of the pump by carrying away unwanted heat generated during the pump's operation); and "X" represents the subcombinations of the basic subject matter or elements peculiar to or associated with the basic subject matter, when such subcombinations or elements are not specifically provided for in some other class (e.g., pump casings, etc.).

In addition to subclasses providing for the above noted material, modern schedules frequently provide for the following additional concepts:

a. Condition Response (Automatic Control)
b. Measuring and Testing
c. Special "A"
d. Convertible
e. Combined
f. Plural "A"
g. Miscellaneous

A brief description of each of the above types of subclasses is given below.

Condition Response (Automatic Control)

Condition response is a broad concept that embraces the variant, Automatic Control, within its boundaries. Condition responsive subclasses are intended to provide a home for devices that include a means to sense a randomly occurring condition or change in condition that will effect a change in the operation of a device provided for in the class. This concept embraces devices as complicated as a milling machine with means to sense the position of a cutting head and acts to disable the machine if any misalignment is sensed. It also includes within its scope a device as simple as a weight biased check valve, wherein the under surface of the valve seat senses fluid pressure which causes the valve to unseat when the pressure against the underside of the seat reaches a predetermined point.

"Automatic Control" is a more restrictive concept which includes means to sense a randomly occurring condition or change of conditions which operates on a separate means to effect control of

an apparatus, e.g., the milling machine mentioned above. This concept requires a sensor, e.g., a slipper or feeler located adjacent to the system, which senses a condition or change in condition, e.g., tool misalignment. Once this condition is sensed, the sensing means operates on another device, e.g., a switch or valve, which controls a different medium to regulate the operation of the controlled device. There has been a tendency in recent years to move away from the title "Automatic Control" and to substitute the title similar to "Control Means Responsive to Sensed Condition".

Another concept closely allied to Automatic Control is Programmed or Cyclic Control. These devices frequently include sensors; however, the device employing the sensors merely performs repetitive operations. There is a basic "law of the machine" and the sensors are actuated in sequence to control the operation of the device based on that law. In other words, the condition sensed is predictable rather than random.

Also embraced by this concept are those devices that employ stored intelligence (e.g., magnetic tape) to control the operation of the machine in a prescribed, repetitive fashion.

These subclasses are generally grouped in the same area of the schedule and this area is generally located relatively high in the schedule.

Measuring and Testing

Many classes provide for their basic subject matter combined with some type of measuring or testing device. This represents a special type of "AB" combined subclass, but is no different in character than any other "AB" type subclass. In fact, its only distinction is its frequent occurrence.

Combined subclasses drawn to a class's basic subject matter combined with heating or cooling means or lubricating means are also frequently found in many modern classes.

Special "A"

It frequently happens that special collections of unique basic subject matter are provided for very high in the class schedule. These collections are of special search value and could get lost if

they were positioned lower in the schedule. This collection will also appear above the "Combined" subclass even though they are not very complicated and are not drawn to combinations or basic subject matter plus perfecting feature. An example of one such collection is drawn to getter type pumps in Class 417.

Convertible

This subclass provides for devices which, while they are the basic subject matter of one class, are intended to be changed into the basic subject matter of another class by a rearrangement of their parts. This concept also provides for the change of one type of device provided for in a given class into a different type of device also provided for in the same class by rearrangement of the parts of the device.

Combined

As previously noted in this handbook, "Combined" represents a dividing point in the schedule. Unless a note to the contrary appears, the subclass is exhaustive of all combinations, i.e., "AB" type and "Ap" type subclasses not provided for higher in the schedule.

Generally, all subclasses appearing below "Combined" will be drawn to either the basic subject matter of the class or to the subcombination and elements peculiar to or associated with that subject matter.

Therefore, a "Combined" subclass, in practice, is a "Miscellaneous" subclass for combinations not provided for elsewhere.

Plural "A"

Another type of collection that frequently appears in a modern schedule is one drawn to systems employing multiple devices provided for in the class. The multiple devices may be of the same type or they may be different types, e.g., two diaphragm pumps connected in series or a diaphragm pump and a reciprocating piston type arranged in the same fashion.

This subclass is usually positioned immediately below the "Combined" subclass.

Miscellaneous

In almost all modern schedules, the last subclass contained in the schedule is "Miscellaneous". This subclass is defined in extremely broad terms and is intended to be exhaustive of all subject matter admitted to the class but not provided for higher in the class. Each "Main Line" subclass is exhaustive for the material provided for in that main line; however, there will always be a residue of material that does not fit the existing "Main Lines". If a "Combined" subclass exists in the schedule, only unprovided for basic subject matter and unprovided for subcombinations and elements will be found in "Miscellaneous". It must be remembered that "Combined" is exhaustive of combinations of the basic subject matter and the subject matter of some other class.

In conclusion, the above model is a theoretical model, and many deviations will be found in practice, e.g., Classes 198 and 251 contain no "Combined" subclass even though they are modern classes. This omission was a conscious act of the Classifier involved and was dictated by the nature of the art embraced by the class.

One must always carefully review a schedule while using it to look for exceptions from this model.

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